What is claimed is:

1. A method for identifying locations of two or more touch inputs to a sensor substrate in a touchscreen system wherein the touch inputs overlap in time, the substrate having an X axis comprising X coordinates and a Y axis comprising Y coordinates, comprising the steps of:

(a) repeatedly measuring signals indicative of the locations of the two or more touch inputs, the locations having X and Y coordinates and the signals having associated X and Y magnitudes;

(b) for each X coordinate, storing the associated X magnitude measured for each repeated measurement as elements in an X object;

(c) for each Y coordinate, storing the associated Y magnitude measured for each repeated measurement as elements in a Y object;

(d) for possible pairings of X and Y coordinates, comparing elements of associated X objects with corresponding elements of associated Y objects; and

(e) selecting pairings of X and Y coordinates corresponding to locations of actual touch inputs based on the comparison of step (d).

2. The method of claim 1, wherein step (d) further comprises calculating a correlation between elements of X objects and elements of Y objects associated with possible pairings of X and Y coordinates for comparing the elements.

3. The method of claim 2, wherein:

an element of the X object comprises a magnitude M(X) associated with an X coordinate;

an element of the Y object comprises a magnitude M(Y) associated with a Y coordinate; and

a correlation R[M(X), M(Y)] between magnitudes of the X object and an magnitudes of the Y object is calculated.

4. The method of claim 3, wherein R[M(X),M(Y)] is calculated using the formula:

$$R[M(X),M(Y)=\frac{(M(X)-\overline{M(X)})\bullet(M(Y)-\overline{M(Y)})}{\left(\frac{(M(X)-\overline{M(X)})^2+(M(Y)-\overline{M(Y)})^2}{2}\right)};$$

wherein $\overline{M(X)}$ represents the arithmetic average of the magnitudes in the X object and $\overline{M(Y)}$ represents the arithmetic average of the magnitudes in the Y object.

5. The method of claim 1, further comprising the steps of:

(f) comparing each X object with other X objects and updating the elements of the X objects to produce a more accurate representation of touch activity on the X axis; and

(g) comparing each Y object with other Y objects and updating the elements of the Y object to produce a more accurate representation of touch activity on the Y axis;

wherein steps (f) and (g) are performed before steps (d) and (e).

6. The method of claim 5, wherein the updating of the elements in each X object in step (f) comprises subtracting a magnitude previously measured for an X coordinate from a current magnitude for the X coordinate.

7. The method of claim 5, wherein the updating of the elements in each Y object in step (g) comprises subtracting a magnitude previously measured for a Y coordinate from a current magnitude for the Y coordinate.

8. The method of claim 5, wherein the updating of the elements of the objects in step (f) or step (g) comprises approximating a magnitude for one of the touch inputs measured over distance as a functional form, and subtracting the approximated functional form from the magnitudes measured for all touch inputs.

9. The method of claim 8, wherein the functional form comprises a Gaussian pulse shape.

10. A touch input system, comprising:

a touch point sensor comprising an X axis and a Y axis, wherein a pair of coordinates composed of one X coordinate and one Y coordinate defines a location; and

a location determining apparatus for determining the locations of touch points comprising:

detecting means for repeatedly detecting touch signals corresponding to X and Y coordinates and associated X and Y signal magnitudes caused by two or more touch points overlapping in a time period;

storing means for storing the X signal magnitudes corresponding to each X coordinate of the touch locations as elements in an X object, and for storing the Y signal magnitudes corresponding to each Y coordinate of the touch locations as elements in a Y object, wherein one object is associated with one coordinate;

first comparison means for comparing elements of X objects to elements of Y objects associated with possible pairings of X and Y coordinates; and

selection means for selecting pairings of X and Y coordinates corresponding to actual touch point locations based on the comparison between elements of the X objects and elements of the Y objects associated with the pairings.

11. The touch input system of claim 10, comprising a second comparison means for comparing each X object with other X objects and each Y object with other Y objects and updating their elements to ensure consistency between objects associated with each axis.

12. The touch input system of claim 10, wherein the detecting means comprises separate channels for detecting X signals and Y signals.

13. The touch input system of claim 10, wherein the time period corresponds to the time period between the repeated detections of touch signals.

14. The touch input system of claim 10, wherein the comparison means for comparing elements of X objects to elements of Y objects calculates a correlation value between X magnitudes associated with an X coordinate and a Y magnitudes associated with a Y coordinate, and the selection means for selecting pairings of X and Y coordinates corresponding to actual touch point locations uses the correlation value.

15. The touch input system of claim 10, wherein the comparison means for comparing elements of X objects to elements of Y objects calculates a correlation value between X magnitudes associated with an X coordinate and Y magnitudes associated with a Y coordinate for all possible pairings of X and Y coordinates, and the selection means for selecting pairings of X and Y coordinates corresponding to actual touch point locations compares the correlation values for all possible pairings.

16. The touch input system of claim 14, wherein the selection means for selecting pairings of X and Y coordinates corresponding to actual touch point locations compares the correlation value to a reference value.

17. The touch input system of claim 16, wherein the reference value corresponds to the correlation value for a specified (X, Y) coordinate pair.

18. The touch input system of claim 16, wherein the reference value corresponds to a correlation value for a specified (X, X) or (Y, Y) coordinate pair.

19. The touch input system of claim 15, wherein the comparison means further multiplies one or more correlation values by a safety factor.

20. The touch input system of claim 19, wherein the safety factor is greater than one.

21. The touch input system of claim 14, wherein a correlation between the magnitudes M(X) associated with an X coordinate and the magnitudes M(Y) associated with a Y coordinate is calculated as R[M(X), M(Y)] using the formula:

$$R[(M(X),M(Y)] = \frac{(M(X)-\overline{M(X)})\bullet(M(Y)-\overline{M(Y)})}{\left(\frac{(M(X)-\overline{M(X)})^2+(M(Y)-\overline{M(Y)})^2}{2}\right)};$$

wherein $\overline{M(X)}$ represents the arithmetic average of the magnitudes associated with the X coordinate and $\overline{M(Y)}$ represents the arithmetic average of the magnitudes associated with the Y coordinate.

22. A system comprising:

a touch panel input device comprising a touch panel sensor having an X axis and a Y axis for indicating actual touch point locations on the sensor;

a signal detector operating for a succession of time intervals to detect an X signal comprising an X magnitude representative of an associated X coordinate and a Y signal comprising a Y magnitude representative of an associated Y coordinate for each actual touch point on the sensor, wherein more than one X signal or more than one Y signal are detected during a single time interval; and

a selector for processing the X signals and the Y signals separately from each other to select pairs of coordinates corresponding to locations of actual touch points, wherein the selector selects the pairs of coordinates based on a correlation value between X magnitudes associated with the X coordinate of the pair and Y magnitudes associated with the Y coordinate of the pair.

23. The system of claim 22, wherein the signal detector comprises a reflector array that acts upon acoustic waves propagating along the touch panel sensor and reflects the waves at sides of the sensor and a transducer for detecting the reflected waves, and wherein the

magnitudes correspond to the amplitudes of the reflected waves and the coordinates correspond to times at which the reflected waves are detected.

24. The system of claim 22, wherein the selector comprises a controller that calculates the correlation.

25. The system of claim 22, wherein the selector compares the correlation between the X magnitudes and the Y magnitudes for a coordinate pair to a reference value to decide whether the coordinate pair corresponds to an actual touch point location.

26. The system of claim 22, wherein the selector compares the correlation between the X magnitudes and the Y magnitudes for a coordinate pair to correlation values between the X magnitudes and the Y magnitudes for other coordinate pairs to decide whether the coordinate pair corresponds to an actual touch point location.